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AUTHOR Hedl, John J., Jr.
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ABSTRACT

The purpose of this experiment was to relate two bodies of research on anxiety: test anxiety, or anxiety proneness specific to the testing situation, and trait-state anxiety. The author hypothesized that state anxiety--anxiety not tied to any particular situation but aroused in "any" situation--should be highly related to test anxiety during a testing situation; and, on the other hand, that state anxiety aroused during a situation of minimal evaluative stress, such as a game, should be less closely related to test anxiety. A total of 60 students were tested in both situations: a game involving no explicit evaluative stress and administration of the Slosson Intelligence Test via computer, a situation of some evaluative stress. Measures of state anxiety were obtained before and after each of these situations. The results failed to confirm the hypothesis. Since the initial analysis indicated that test anxiety was not as responsive to situational stress as initially hypothesized, a succeeding analysis was conducted to determine whether test anxiety was more similar to the construct of trait anxiety. The results of this study showed that the test anxiety construct is not as responsive to situational stress as is the state anxiety measure. References are included. (Author/SES)

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John J. Hedl, Jr.

Florida State University

ABSTRACT

The purpose of this experiment was to relate two bodies of research on anxiety: test anxiety and trait-state anxiety. It was reasoned that state anxiety measures obtained in an evaluative testing condition should be more similar to test anxiety than state anxiety measures obtained in non-evaluative situation, such as a game. A total of 60 students received both experiences. The results failed to confirm the hypothesis. Test anxiety was less sensitive to fluctuations of evaluative stress than state anxiety, and more closely related to trait than state anxiety.

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TEST ANXIETY: A STATE OR TRAIT CONCEPT?

John J. Hedl, Jr.

Florida State University

Anxiety is a construct of importance in many different behavioral disciplines. Research and theory on anxiety has typically treated this construct as a personality variable which was relatively stable over long periods of time. The conception that anxiety had considerable situational variance was implicit in the construct of test anxiety as originated by Mandler and Sarason (1952), and most recently reviewed by Wine (1971). Spielberger, Lushene, and McAdoo (1971) have pointed to the importance of assessing the temporal fluctuations of anxiety over different situations in their conception of state anxiety. The purpose of the present study was to relate these two areas of research in which the situational and temporal characteristics of anxiety have been emphasized.

Spielberger et al., (1971) have emphasized the necessity to distinguish between anxiety as a transitory state, or as a relatively stable personality trait. Anxiety as a state (A-State) is conceptualized as a feeling condition in the student characterized by feelings of dread or apprehension which vary in intensity, fluctuate over time, and are highly responsive to situational stress. Trait anxiety (A-Trait), on the other hand, is conceptualized as the relatively long term personality trait of anxiety proneness, i.e., the disposition to respond with elevations of state anxiety under conditions of threat to self-esteem. Clearly,

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these two conceptions of anxiety are not independent of one another; and the theoretical expectation of a moderate positive relationship between state and trait anxiety has been empirically verified (Spielberger, Gorsuch, & Lushene, 1970).

Test anxiety was conceptualized as anxiety proneness in a specific situation: the testing situation. It was anticipated that a scale which focused specifically on the student's feelings about testing situations would be more closely related to test performance than measures dealing with anxiety as a general personality trait. Operationally, test anxiety is measured by the Test Anxiety Questionnaire (Mandler & Sarason, 1952) or by the Test Anxiety Scale (Sarason, 1958).

The test anxiety construct is specific to the testing situation. State anxiety, on the other hand, is not tied to any particular situation, but instead refers to the degree to which transitory feelings of anxiety are aroused in <u>any</u> situation. Therefore, state anxiety during a testing situation should be highly related to test anxiety. On the other hand, state anxiety aroused during a situation of minimal evaluative stress, such as a game-like situation, should be less closely related to test anxiety. It was the purpose of this study to test this hypothesis.

Method

The research design consisted of placing students in a situation involving no explicit evaluative stress (game); and then administering the Slosson Intelligence Test via computer, a situation of some evaluative stress. Measures of state anxiety were obtained both before and after each of the two situations. All students participated in both types of tasks.

Procedures

The procedures were administered in the following sequence: (a) A pre-task period during which students responded to the Test Anxiety Scale (TAS; Sarason, 1958) and the A-Trait scale of the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970). (b) A non-evaluative period during which students played a game on a cathode ray terminal connected to an IBM Instructional System. (c) An evaluative period during which the Slosson Intelligence Test (Slosson, 1963) was administered. The five-item STAI A-State scale was administered both before and after the game and the intelligence test.

Non-Evaluative Period. Students received written instructions informing them how to operate the computer terminal; and then responded to the brief five-item A-State scale, with instructions to respond in terms of "How do you feel right now." Practice in the operation of the terminal keyboard was presented and students "signed on" to the computer game.

During the game students worked individually at computer terminals. The game consisted of a simulated horse race in which artifical odds on six horses were given and an imaginary budget of $10,000 allotted for "betting." Students were then asked to indicate on which horses they wanted to bet; the amount of the bet; and whether they wished to bet to win, place or show. After the bets had been placed, the actual race was viewed on cathode ray terminal. Six horses were included in each race, represented by elongated "m"s. During the race, the computer program simulated the race by allowing the various "horses" to

flash across the screen at a predetermined, randomly selected pace. Winning or losing at the game was randomly determined. Students were allowed to play the horse race game for 20-25 minute periods. At the conclusion of any one race students were informed of the present status of their imaginary bank account and asked whether they wished to bet on the upcoming race. Following completion of the game period, the five-item A-State scale was re-administered with instructions to indicate "How did you feel during the game you just played."

Evaluative Period. A detailed description of terminal operations for the administration of the Slosson Intelligence Test on the computer terminal was presented. A brief attitude scale dealing with feelings toward computer testing was then administered. After "signing on" to the terminal, students again completed the five-item A-State scale, with instructions to indicate how they felt at present.

The computer-administered Slosson Intelligence Test was then taken by each student. Test items were individually presented on the computer terminal and students responded to each question by typing in their responses. The computer program immediately evaluated the adequacy of answers and when the scoring of particular items was indeterminate, students were asked to amplify their responses (Hedl, 1971).

The computer program began by presenting item 21-3 to all students. Following this item, the program proceeded sequentially in reverse, in order to establish a basal age. When basal age had been reached, students were branched forward to item 21-6 and the program continued to administer items until a ceiling or the test end had been reached. Ceiling was defined as failure on 10 consecutive items, and basal when

this number was passed.

When the test had been completed, the five-item A-State scale was re-administered with instructions to respond in terms of how they felt during the intelligence test they had just completed.

Subjects

A total of 60 students participated in this experiment (25 males; 35 females). The sample was drawn from an undergraduate educational psychology course; volunteers received course credit for their participation.

Results and Discussion

The hypothesis demanded that the A-State measure dealing with the students' feelings during the intelligence test ought to be most similar to test anxiety. This hypothesis was investigated by multiple linear regression techniques (Cohen, 1968). A full model was generated consisting of all four A-State scores, regressing onto the TAS. Two restricted models were then formulated. In the first of these, the A-State dealing with the student's feelings during the intelligence testing was deleted. The difference in the percentage of variance accounted for by these models was, therefore, a measure of the importance of specific evaluative stress on the relationship between the A-State and TAS. The results of this comparison yielded an F of 1.98 (df = 1/55), which was not significant. The second restricted model deleted both the A-States administered during the intelligence test. Again, comparison with the full model was not significant (F = 1.01, df = 2/55).

The results of this analysis indicated that the evaluative stress condition did not contribute any more variance to test anxiety than did the A-State measures during the presumably non-evaluative game situation. The hypothesis that state anxiety during evaluative situations measures feelings most similar to the test anxiety scale was, therefore, not confirmed.

Since the initial analysis indicated that test anxiety was not as responsive to situational stress as initially hypothesized, a succeeding analysis was conducted to determine whether test anxiety was more similar to the construct of trait anxiety. For this analysis, a second full model was formulated, containing the four A-State measure and the scores on the A-Trait scale. A restricted model was then formulated from which the A-Trait score was deleted, leaving only the four A-State measures. This comparison yielded an F of 5.18 (df = 1/54), significant beyond the .05 level. The omission of the A-State measures from the full model in the presence of A-Trait did not result in a significant decline in accountable variance. These results strongly suggest that the test anxiety conception can be viewed as more nearly a trait measure than a state measure.

The design of this experiment assumed the operation of differential evaluative stress as a function of the game and testing situations. In order to evaluate this assumption, a one-way analysis of variance for repeated measures (Winer, 1971) was computed on the four A-State measures. Table 1 presents the means and standard deviations of these measures.

Insert Table 1 about here

This analysis yielded an F of 20.56 (df = 3/177), significant beyond the .001 level. These results indicated that there was an overall difference in the amount of A-State evoked by the differential experimental treatments. A further comparison of the post intelligence A-State scores with the post game A-State scores yielded a correlated t of 6.80 (df = 59), significant beyond the .001 level. Thus, the A-State data confirmed the assumed increase in evaluative stress as a function of the experimental treatments. Subsidiary analyses were conducted to determine whether state anxiety interacted with sex, and/or with A-Trait, and thus obscured the general trend of the data. Both of these analyses revealed no evidence of such interactions.

The results of this study indicate that the test anxiety construct is not as responsive to situational stress as is the state anxiety measure. The feelings solicited by the test anxiety scale deal with a number of different evaluative situations such as: intelligence tests, surprise exams, final exams, "pop" quizzes, etc. It is, therefore, not surprising to note that test anxiety is not sensitive to temporal fluctuations in the intensity of evaluative stress. These findings also suggest that if trait and state anxiety theory and test anxiety theory are to be related a different measure may well be required. Such an instrument should solicit the student's feeling about the particular test he has just taken, rather than testing in general, and would then combine the content characteristics of the test anxiety construct with the sensitivity to fluctuations of evaluative stress attained by measures of state anxiety.

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TABLE 1
Means and Standard Deviations of the STAI
A-Trait, TAS, and STAI A-State Scores (N = 60)

Measures	Mean	*SD*
STAI A-Trait	38.13	9.39
TAS	14.60	7.06
STAI A-State		
Pre Game	8.07	2.85
Post Game	7.47	2.92
Pre IQ Test	9.63	3.04
Post IQ Test	10.40	3.76